

Radio Physics Solutions
Application for a Market Trial License
File Number: 0031-EX-CN-2021

Description of Market Trial, Product Operations, Field Testing

Radio Physics Solutions develops stand-off threat detection systems that are designed to scan for guns and bombs being carried by persons. The detection system uses millimeter wave scanning in the 71-86 GHz band to detect the signature shapes or components of rifles, guns, IEDs, bomb vests, etc. The radar scanning device has been integrated with video systems, optical detection systems, and artificial intelligence to identify when a person is in the area of the Optracon, turn on the millimeter wave scanner, complete its radar detection in under 1 second, and alert security personnel to intervene if any threats are detected.

The product, which has been explained extensively in response to questions from the FCC, both WTB and OET, does not operate its radar detection when no people are present. Further, the narrow beam of the radar scanner has been designed to keep the RF energy focused on a person, not to have it propagate randomly in the area where the Optracon is installed. Further mitigation to protect other RF operators includes: downtilt of the Optracon antenna, fast sweeps through the spectrum, fine-tuned scanning limited to bands outside of the 76-81 GHz vehicular radar band.

The FCC is currently evaluating a request for Waiver submitted by Radio Physics which would allow Radio Physics to seek an equipment authorization for its product and to get licenses for use of its radio transmitter. The FCC staff offered Radio Physics informal, non-binding, advice that it should seek a license for a market trial as the next phase of its regulatory process. This application is being filed following that informal, non-binding guidance.

Technical Operating Parameters

This application for a market trial requests the same technical parameters that have previously been licensed to Radio Physics under experimental license WL2XFR.

Market Trial Description

In accordance with the provisions of 47 C.F.R. Section 5.602, Radio Physics is seeking to undertake a market trial to determine the market acceptance of its Optracon stand-off threat detection system. In the sections below, Radio Physics will present detailed information about the proposed scope and scale of the market trial. This initial section summarizes Radio Physics' plans for compliance with the provisions of Section 5.602(d).

(d) All transmitting and/or receiving equipment used in the study shall be owned by the experimental licensees. Marketing of devices is only permitted as follows:

- (1) The licensees may sell equipment to each other, e.g., manufacturer to service provider,
- (2) The licensees may lease equipment to trial participants for purposes of the study, and
- (3) The number of devices to be market shall be the minimum quantity of devices necessary to conduct the market trial as approved by the Commission.

47 C.F.R. §5.602(d)

1. Ownership of Equipment: Radio Physics will own all of its equipment during the proposed market trial. The Optracon system is not a consumer device, and so there is no reason to sell the Optracon to a service provider. While in the future Radio Physics may have distributors or dealers in the US, they will not participate in the market trial, and no other party will have ownership of the equipment.

2. Leasing of Equipment: Radio Physics plans to lease the Optracon system to participants in the market trial study. The participants in the study will be selected from a range of potential market segments that are interested in using the Optracon stand-off threat detection system. The participants selected will be chosen based on several characteristics:
 - Each participant will agree to abide by the specific terms of the experimental license that will be issued to Radio Physics,
 - Each participant will assign personnel who will participate in system monitoring and reporting on the effects of the system on the safety enhancements that result from using Optracon,
 - Participants will be selected to explore a range of different markets, pricing options, and installations, to assist Radio Physics with product enhancements.

3. Number of Devices: Radio Physics plans to have a limited number of customers from law enforcement, academia, faith community, and government participate in the market trial. These various participants all bring different challenges and perspectives to the installations to protect people in their environments. Radio Physics anticipates perhaps four customers in each market segment because of the varied nature of each market segment. There are distinct differences in size and scope of schools and churches, for example. There are different challenges faced by municipal government than there are by state governments. So, these factors are part of the evaluation that Radio Physics hopes to conduct through its market trial.

Radio Physics is seeking a market trial that will allow for the use of up to 150 devices during the market trial to be able to serve the needs of the prospective trial participants. This number is the result of planning studies which show that several units of the Optracon system may be needed to protect a particular site. For instance, a school may wish to protect its entrance, its sporting facilities, and its back door. This could require the installation of five or six Optracon scanners, which need to be integrated to deliver the security needed by the school. This number is the maximum expected to be needed, and Radio Physics will keep the FCC informed as units are licensed and deployed under its market trial license.

Scope and Scale of the Trial:

Radio Physics is seeking authorization for a trial that could use up to 150 Optracon systems over a 12-month period after its market trial license might be granted. The demand for systems worldwide is great, and it is highly likely that Radio Physics will only be able to dedicate 75-100 units to this trial, but the additional limit is intended to give Radio Physics some flexibility should some customers want a broader deployment, such as the Transportation Security Administration or the Department of the Navy.

Radio Physics is exploring the potential pricing that would be acceptable to federal, state, and local governments. Further, it is exploring potential pricing for private security requirements at places like casinos and event venues. Each model has variables associated, and these need to be explored to determine the best way to have a viable launch of the product, when that is possible.

The basic pricing proposed is, in accordance with the FCC's regulations, a leasing model:

Month 1 lease price:	\$15,000.00
Months 2-12 lease price:	\$10,000.00 per month

Radio Physics will have its customer sign a lease agreement that specifies that the equipment belongs to Radio Physics throughout the lease term, and the equipment must be returned to Radio Physics at the end of the lease.

Site Licensing: Each site will be individually licensed by Radio Physics. At this time, there are some customers and sites still in conversation with Radio Physics. With the approval of the Commission, Radio Physics is planning to modify its market trial license to add new locations as they are needed, ensuring that all sites are properly licensed.

The Optracon systems will be installed by a team of professionals based in the United States who have been extensively trained by Radio Physics. Covid-19 pandemic travel restrictions together with staffing limitations, and travel costs prevent Radio Physics' internal engineering team from handling each installation. However, each installation will be signed off by these trained professionals, and then certified by a Radio Physics supervising engineer.

Public Interest

The preparation of this application was underway before January 6, 2021. The events of January 6 at the US Capitol have increased interest in the use of a stand-off threat detection system that could identify person-borne IEDs and weapons being carried in places that need to be protected. Ongoing threats across the capitals of the 50 states are yet another reason why a market trial is in the public interest.

Granting this market trial license will give Radio Physics an opportunity to test the market in the US and to provide information on the performance of the Optracon system in the field that should help the FCC to complete its evaluation of the pending waiver request.

Because public health and safety are involved, Radio Physics believes that there is a strong public interest benefit in the grant of this market trial license application.

Testing and Monitoring Program:

Over the course of many meetings between Radio Physics and OET and WTB staff during 2020, the FCC staff raised a number of concerns regarding protection of vehicular radar operations. Radio Physics engineers presented calculations and propagation analyses that showed that the potential harm to vehicular radar was less than the noise floor. Radio Physics will also be testing and

monitoring the radar signals to ensure that the footprint of the transmission is as limited as predicted.

In preparing this application, Radio Physics has given in depth consideration to the field testing that is needed. Radio Physics has determined that the best option will be to engage one of the FCC's certified testing bodies to design and undertake field tests, and then to work with Radio Physics to present the results of the field studies to the FCC.

Radio Physics believes that the expertise of a TCB will bring some impartiality and credibility to the design and conduct of the testing, which will make the results more persuasive. Radio Physics hopes to set up one or more conversations that will include FCC engineers and the TCB to design field studies that provide information that will be of use to the FCC.

Technical Details - Recap

The Optracon system does not use its embedded radar unless there is a person identified by the integrated video detection system. By default, the radar is off, only coming on when there is someone to scan.

Radio Physics has presented extensive additional information about the performance of the system. Before any proposed installation Radio Physics will search to ensure that there are no millimeter wave data links which could be subject to interference from the installation.

Rather than summarize the analysis that Radio Physics undertook with regard to protection of vehicular radar, Radio Physics is incorporating by reference a technical paper it submitted to the FCC in June 2020, DS42005. It is submitted as an additional exhibit to this application.

Conclusion

Radio Physics is applying for a market trial license for the installation and operation of its Optracon stand-off threat detection system. This exhibit explains how Radio Physics proposes to comply with the provisions in the Commission's regulations governing market trial licenses. Further, Radio Physics is proposing to conduct field measurements in accordance with protocols to be designed with a TCB and the guidance of FCC engineers, so that the measurement studies produce information that will be helpful to the FCC in its evaluation of the Optracon operations under the market license.

Technical information on the operations of the system is attached, for the convenience of any reviewers needing additional information. Radio Physics will ensure that its proposed installations protect millimeter wave licensees from interference.

Should there be any questions or if additional information is needed in to review this application, please contact Anne E. Cortez, Esq. alc@conspecinternational.com or 520-360-0925.